Moore County Schools:
Integration of Computer Science & STEM Principles in K-5 Classrooms

Dr. Bridget Johnson
Director for Curriculum and Instruction
Mr. Steve Johnson
Assistant Director for Technology and Digital Learning
Mr. Austin Morris
Pinecrest High School English/Social Studies Teacher
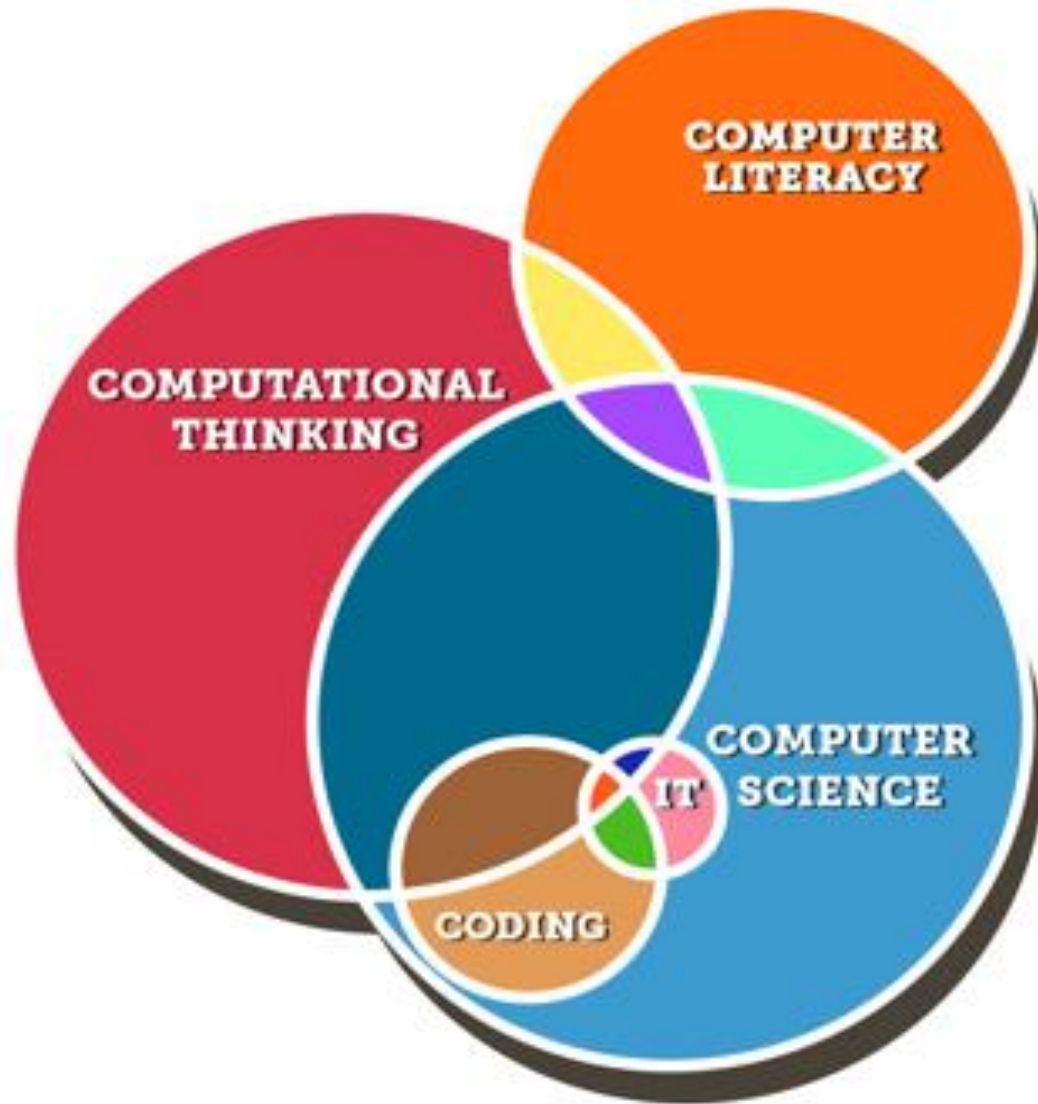**Mrs. Mariah Morris**
Burroughs Wellcome Fund North Carolina Teacher of the Year

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Our Computer Science/STEM Integration Journey

- Teachers as Leaders

- K-5 Engineering Thread

- Engineering/Design Process

- The Role of Digital Integration Facilitators (DIFs)

- Our Success

- Classroom Examples from K-12

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Framing the Vision

- Why is **computational thinking** critical?

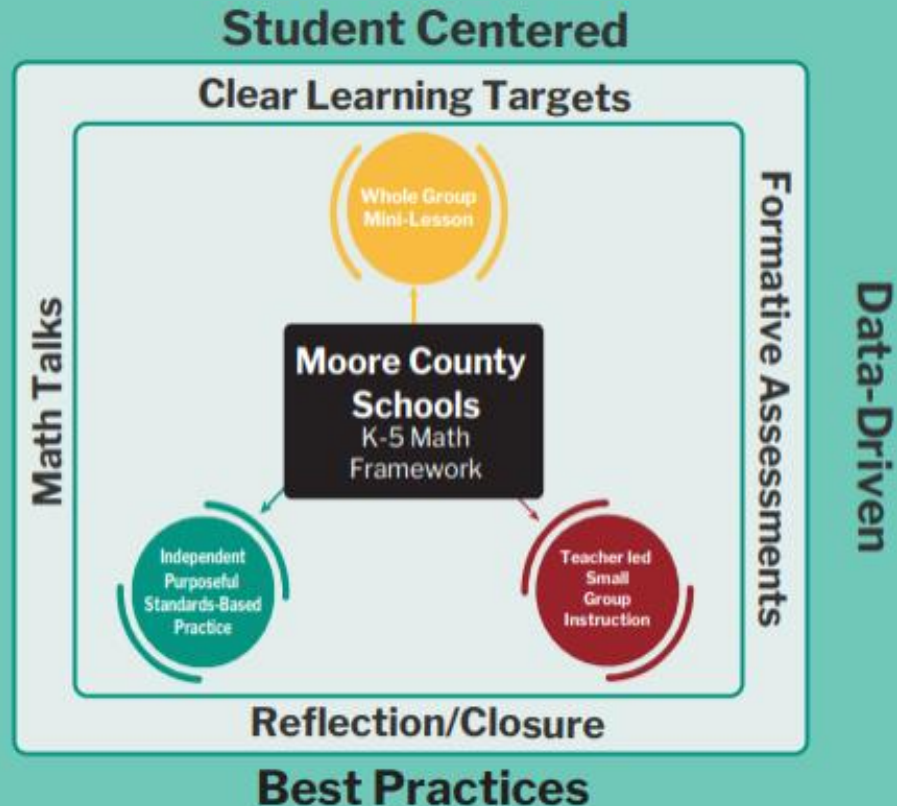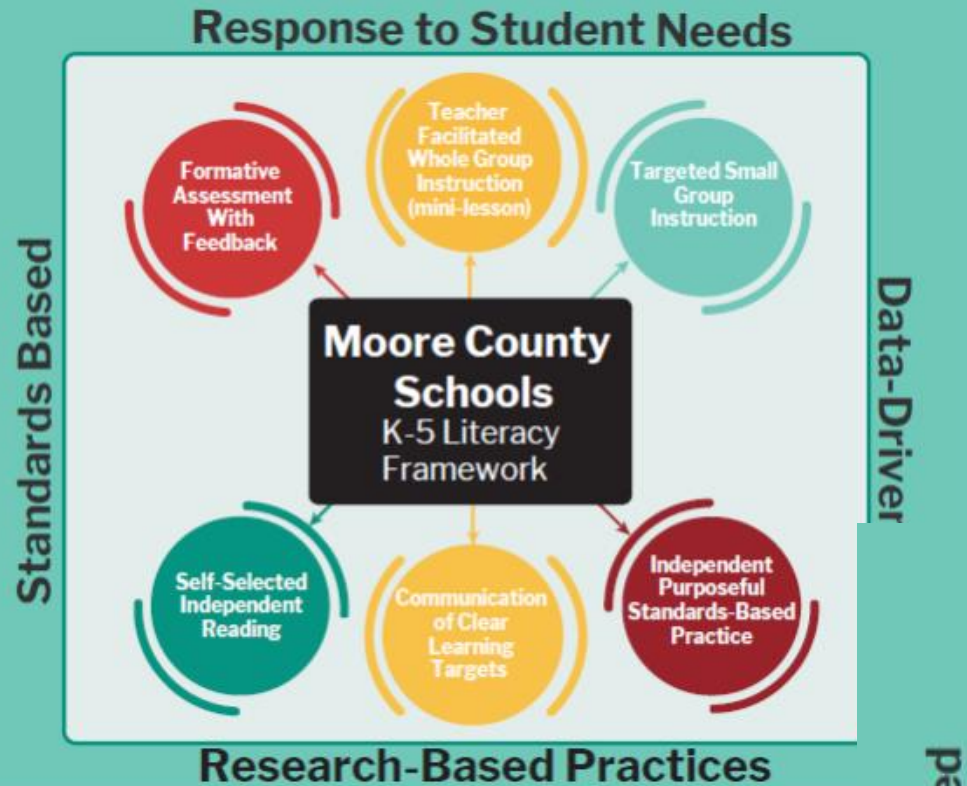- How is Computer Science **"future proof?"**

- Where does **STEM** fit in?

Teachers as Leaders

Summer Curriculum Workshops

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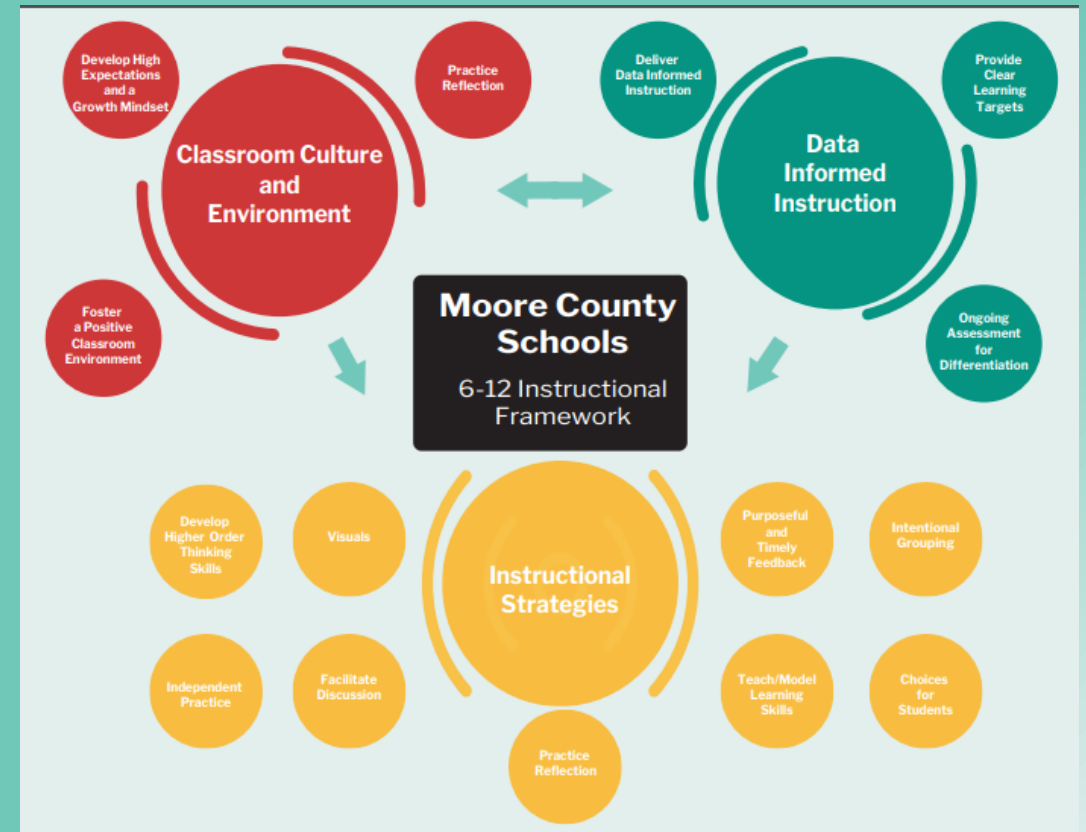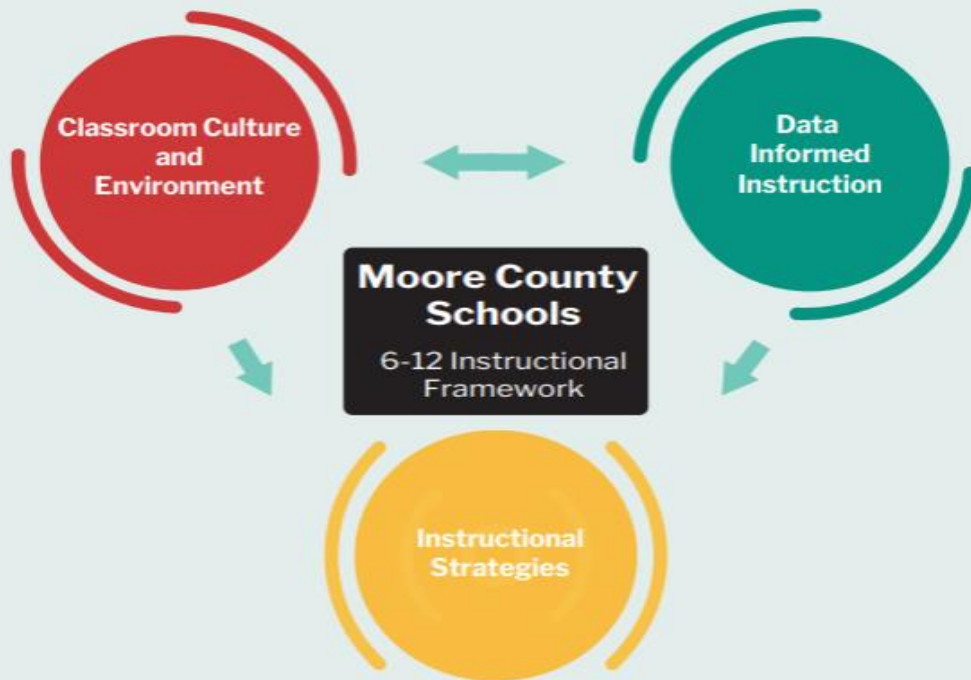ENGAGE · INSPIRE · SUCCEED

Teachers as Leaders

K-5 Frameworks of Instruction

Response to Student Needs

Formative Assessment With Feedback

Teacher Facilitated Whole Group Instruction (mini-lesson)

Targeted Small Group Instruction

Moore County Schools K-5 Literacy Framework

Self-Selected Independent Reading

Communication of Clear Learning Targets

Independent Purposeful Standards-Based Practice

Standards Based

Data-Driven

Research-Based Practices

Student Centered

Clear Learning Targets

Whole Group Mini-Lesson

Moore County Schools K-5 Math Framework

Independent Purposeful Standards-Based Practice

Teacher led Small Group Instruction

Math Talks

Formative Assessments

Standards-Based

Data-Driven

Reflection/Closure

Best Practices

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Teachers as Leaders

6-12 Frameworks of Instruction

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K-5 Engineering Thread

- Aligned to instructional frameworks

- Teacher developed & tested

- 2 engineering projects/tasks per grade level, leading to explosive teacher/DIF led growth

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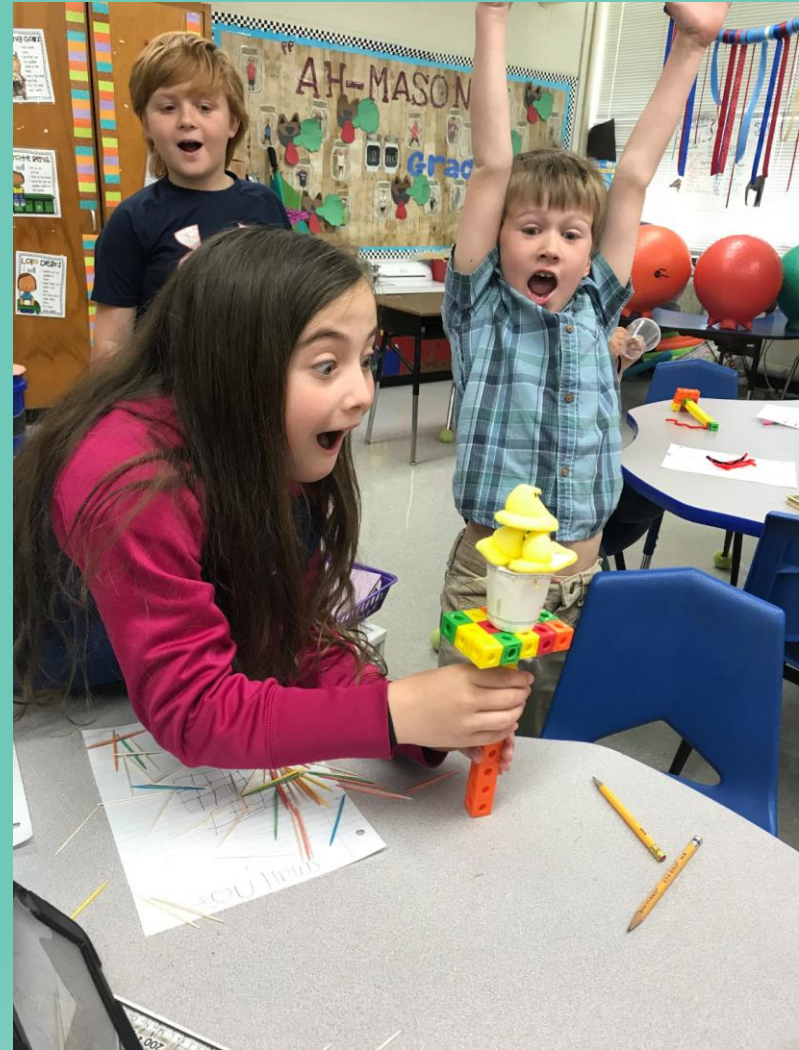
Engineering/Design Process

- A **flexible, problem-solving** process

- Builds **productive failure** into the classroom- breeding perseverance and growth mindsets

- **Applies across all content areas** & can be connected easily to standards
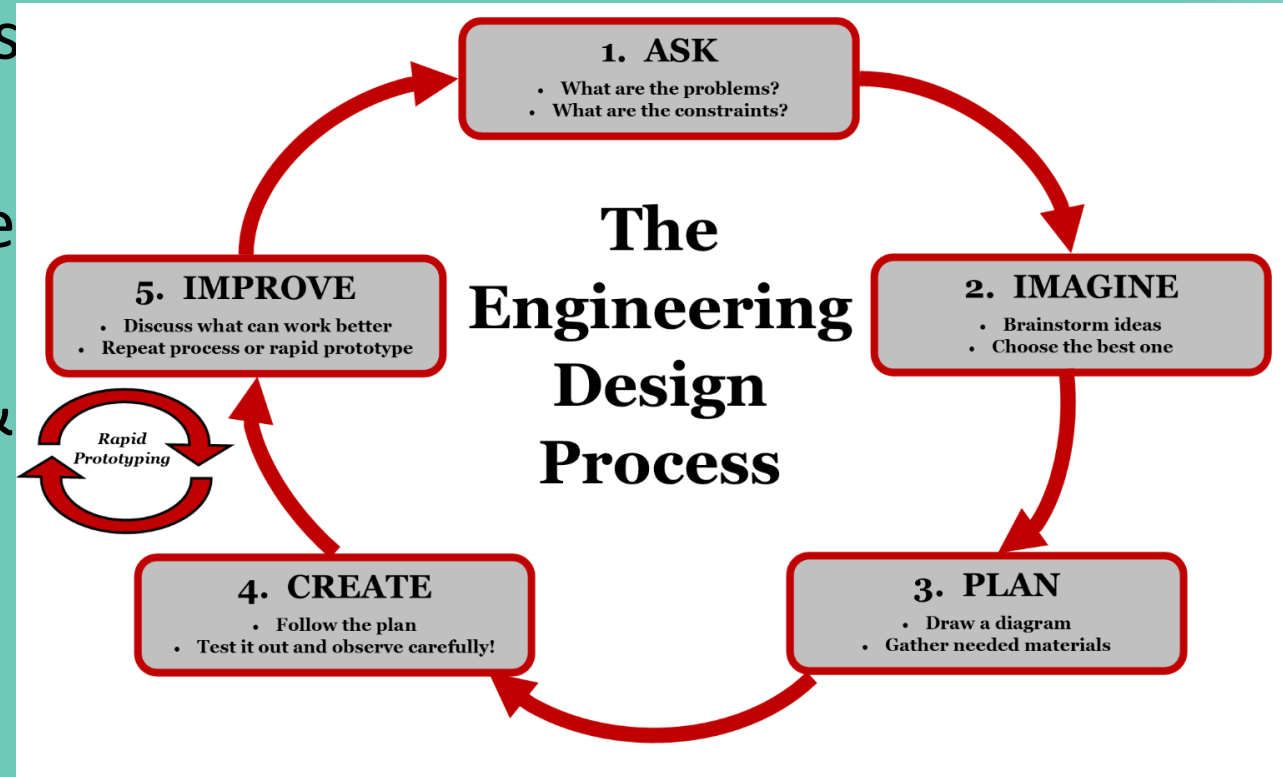
**NC Digital Learning Competencies: Leadership in Digital Learning**
Promote open, lifelong learning as an iterative process of success, grit, and perseverance.

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Engineering/Design Process

K-5 as catalyst for system-wide change

- Immediately & necessarily engages minds with the 4 C's (critical thinking, creativity, collaboration, communication).

- Incredible year-over-year growth in ability to work in teams to accomplish tough tasks

- Robotics and programming as on-ramp toward design thinking

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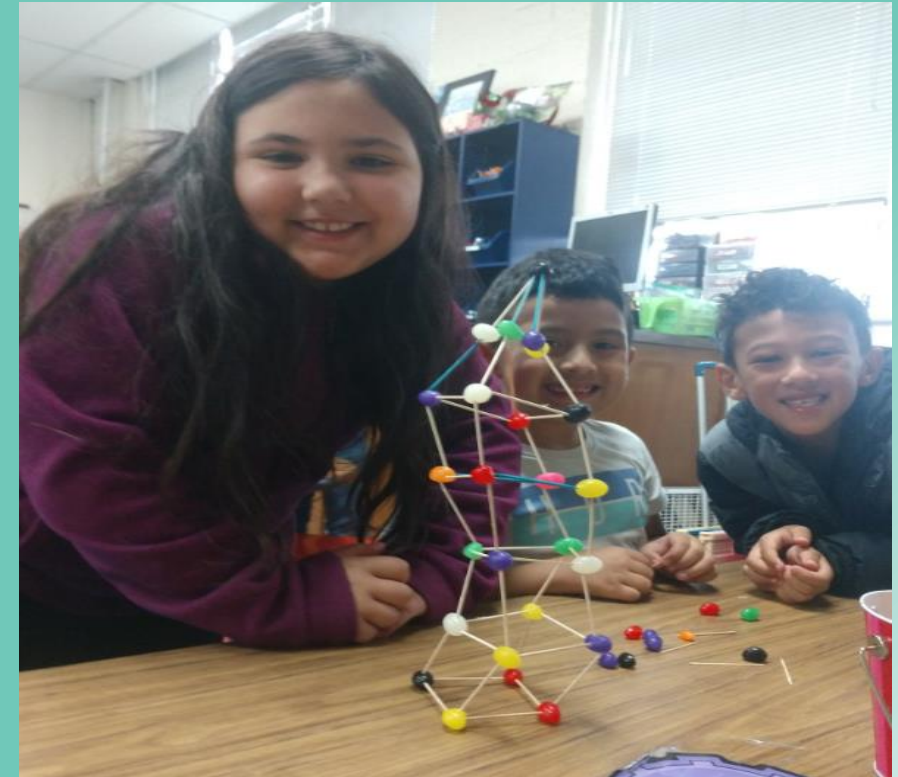
Current State in MCS

- 5+ years of K-12 robotics implementation

- 3+ years of engineering thread work in classrooms

- 7 years of annual summer STEM Camp (sustainability model)

- Cyber Patriot, Girls Go Cyber Start

- First in Flight Drone Academy + expanding CTE & community college options

- 3 NC Digital Learning Initiative Grants - Showcase (Spring 2018), Implementation (just finished year 1 of 2), Innovation Academy (just finished year 1 of 3)
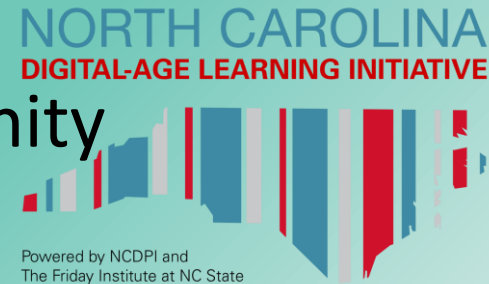
Growth & Ongoing Challenges

Reasons for Explosive Growth

- DIF (Digital Integration Facilitator) Team: Teacher Support

- Support from Senior Levels - Direct Involvement

- Design Thinking mindset from team- always improving

- DLI Grants adding much fuel to the fire

Ongoing Challenges

- Changing mindsets, particularly 6-12

- Tenuous budgetary support for coach/DIF positions

- Middle school gap identified - scheduling / mindset shift - building essential bridge

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Elementary Classrooms
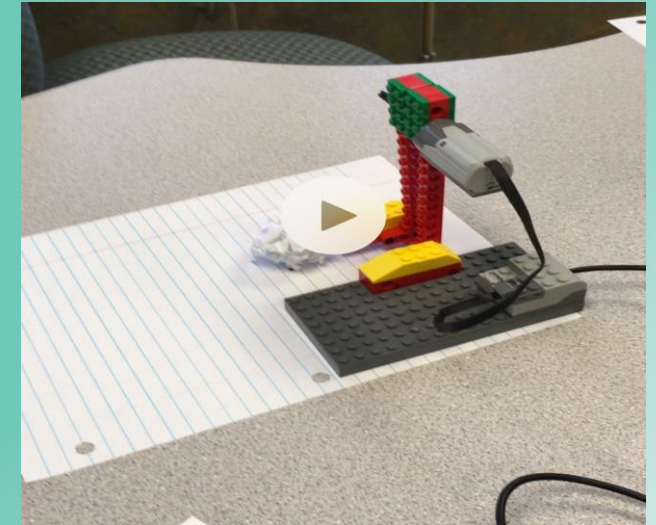
Computer Science and STEM

Incorporated into the **content standards** and utilizing the **4Cs**

Elementary Classrooms

Engineering ● **Robotics** ● **Coding** ● **Computer Science**

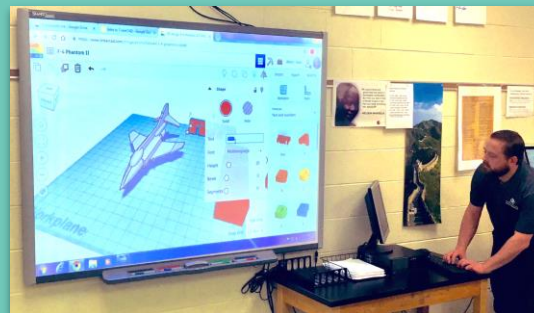Literacy   Writing   Math   Science

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Secondary Classrooms

Secondary Classrooms

Digital Integration Facilitator (D.I.F.) Team
Gradual Release Model of Instructional Coaching

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Closure and Next Steps

● Thank you for the opportunity to share the hard work of our teachers and students!
● We look forward to continuing this partnership in hopes of promoting computer science and design thinking across the state of North Carolina
● If you or anyone else is interested in visiting our classrooms to see this in action as well as speak directly to students, teachers, and school admin- our DLI Innovation Academy grant is designed for exactly this purpose: Please visit k5engineers.org to see site visit opportunities.

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